

Significant Figures (“sig figs”) Handout

Counting sig figs in reported numbers:

1. All non-zero numerals are ALWAYS significant.
(1, 2, 3, 4, 5, 6, 7, 8, 9)
2. Zeros are frequently significant.
 - a. In number's with explicit decimal places: left, not; trapped & right, yes.

0.0050040

left zeros NOT trapped zeros YES right zero YES

3 00 . 8 0
trapped right zero
zeros YES
YES

51, 000,000.00
right zeros
YES

- b. In number's WITHOUT explicit decimal places:

3 0 , 1 00
trapped right zeros
zero NOT
YES

5 0, 1 00,000
trapped right zeros
zero NOT
YES

Hint: convert to scientific notation to see sig. figs.

Significant figures in calculations:

1. Multiplication and division
Result has the same number of sig figs as the lowest number of sig figs in the input.

$$5.0 \times 2.00 = 10.$$

$$\begin{array}{ccccc} 2 \text{ sig figs} & 3 \text{ sig figs} & & 2 \text{ sig figs} & \\ 10. & / & 2.00 & = & 5.0 \\ 2 \text{ sig figs} & 3 \text{ sig figs} & & 2 \text{ sig figs} & \end{array}$$

2. Addition and subtraction
Result has the shortest number of decimal places as the lowest number of decimal places in the input.

$$\begin{array}{ccc} 5.00 & + & 6.0 & = & 11.0 \\ \text{2 dec place} & & \text{1 dec place} & & \text{1 dec place} \end{array}$$

$$\begin{array}{ccc} 10. & - & 2.00 & = & 8 \\ 0 \text{ dec place} & & 2 \text{ dec place} & & 0 \text{ dec place} \end{array}$$

3. Sig figs in logs.
Result has the same number of decimal places in the input
has sig figs.

$$\log(1.00 \times 10^{-5}) = -5.000$$

3 sig figs 3 dec place

4. Sig figs in antilogs.
Result has the same number of sig figs as the number of decimal places in the input.

$$\begin{array}{ccc} 10^{-6.00} & = & 1.0 \times 10^{-6} \\ \text{2 dec place} & & \text{2 sig figs} \end{array}$$

5. Combinations of addition and subtraction. Follow order of operations: [(parenthesis), x and /, + and -]

$$\underset{\substack{\text{0 dec place} \quad \text{2 dec place}}}{3.00 \times (5 + 7.00)} = \underset{\substack{\text{0 dec place}}}{3.00 \times (12)}$$

$$\underset{3 \text{ sig figs}}{3.00} \times \underset{2 \text{ sig figs}}{(12)} = \underset{2 \text{ sig figs}}{36}$$